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NOTES OF A NATURALIST ON THE WEST COAST OF SPITZBERGEN.

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The publications of Prof. Newton, "On the Birds of Spitzbergen,"* and "On the Zoology of Spitzbergen,"† as well as of the Swedish Professors Malmgren and Nordenskiöld, in addition to works by numerous other writers during the last two centuries (a list of which is given by Prof. Newton in 'The Ibis'), have made the Ornithology of that country pretty well known; yet even in this tolerably worked-out class I was able during a short visit which I paid to Spitzbergen last summer to add two species not previously, I believe, obtained there. As my visit was confined to the best known side, the west coast, and as I was only about nine days actually in Spitzbergen waters, much novelty must not be looked for in the present paper: its chief claim to interest rests simply in being a record, however imperfect, of what was to be seen in that out-of-the-way region as lately as last summer. Among my fellow-tourists was Mr. Abel Chapman, of Sunderland, to whose notes I am indebted for the better portion of the facts here stated.

At the risk of making this communication somewhat long, I have thought it best to begin by giving, as shortly as possible, a narrative of the voyage from the time of leaving Tromsö (we sailed originally from Bergen) to the time of the return of the

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* 'Ibis,' April, 1865.

† Proc. Zool. Soc., 1864.

"Pallas" to that port, mentioning the various birds and beasts as they were met with, and reserving for another number of 'The Zoologist' a summary of the species, with some critical notes.

July 23rd. Without stopping to enumerate all the birds to be seen, or rather those we saw, at Tromsö, I may mention that the species characteristic of the place, whenlying at anchor off the town, are Richardson's Skuas and Kittiwakes; by the date of our return here the Skuas had almost entirely left. It is always a difficulty with me to know the exact meaning of such epithets as "common" and "abundant," when used in local lists of birds, but I think these words might be fairly employed in speaking of the White-tailed Eagle along this part of the coast. We started for the north during the afternoon, and as we steamed along, we observed Common Guillemots, Kittiwakes, Richardson's Skuas, a few Puffins, and Chapman saw two Little Auks at different places in the Fjord. At one place in the Fjord we saw from the ship a lot of tame Reindeer on the hill-side. Two large whales were spouting close to the ship in the evening; these I set down at the time as "Finners," *i. e.* the Common Rorqual (*Balænoptera musculus*, Linn.). Certainly the majority, and I believe *all*, without exception, of the whales that we saw, both off the coast of Norway and in the ocean to the north of that country, had dorsal fins. On reading in Nordenskiöld's 'Voyage of the Vega' (vol. i., p. 170, English edition) that Sibbald's Rorqual (*Balænoptera Sibbaldii*, J. E. Gray) is the commonest species off the coast of Finmark, or is at least almost exclusively the only species hunted there, and other accounts,* I suppose it likely that some at least of the largest of the whales seen by us off the north-west of Norway belonged to this species. But on examining the available figures of various species of whale, it seems to me that the Killer (*Orca gladiator*, Lacépède) is, from the rounded contour of the back, the broad flukes of the tail, and especially from the shape of the high dorsal fin, much more like those individuals that we saw most distinctly. However, I have little doubt that we saw more than one species, perhaps all these three, and, farther south, what may have been Pilot Whales (Ça'ing, or Bottle-noses = *Globiocephalus melas*,

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* See the account of this Whale in 'The Fauna of Scotland,' Part I., Mammalia,' by the late Mr. Alston; also Bell's 'British Quadrupeds' (2nd edition), and Mr. Southwell's 'Seals and Whales of the British Islands.'

Trail). So far as I am aware not one Right Whale (*Balæna mysticetus*) was seen; to the White Whale I shall refer later on.

July 24th. At sea, lat. at noon 72° 8′ N., fine. A large flock of Kittiwakes followed the ship all day from the time of our first look out in the morning. These were chased by Richardson's Skuas, of which there were usually three to six or more in sight at once. About 2 p.m., about lat. 72° 27′ or 28′, saw two Long-tailed Skuas (*Stercorarius longicaudus*, Vieillot) together. Fulmar Petrels seen all day, getting gradually more numerous as we got north, one or more nearly constantly in sight. Guillemots, in parties of from ten to twenty individuals, at frequent intervals; we were unable to satisfy ourselves whether these belonged to the Common or Brünnich's species, but being to the south of Bear Island they were probably of the former. Many were flying rather high for Guillemots. Chapman observed a Richardson's Skua chase one of these birds, which thereupon went "flop" into the water, and dived out of the way of his persecutor. Several whales (? sp.) seen during the day. At 9 p.m. came to a field of ice in about N. lat. 73° 35′, long. E. from Greenwich 19° 20′.

July 25th. At sea, off Bear Island; thick fog in morning, sea very smooth. Through loose ice all the morning. Chapman saw a single Black Guillemot early this morning. At about 10.30 a.m. I saw a bird over the ship, the size of a Guillemot, but I caught sight (in the fog) of a Puffin-like beak; seeing it was turning back, I directed the attention of one of my fellow-passengers to it, he offering to bet any money that it was a Guillemot, from its size, but as it flew close past us he agreed with me that it was a Puffin, and this was no doubt the first Northern Puffin (*Fratercula glacialis*, Leach) that crossed our track. After steering for a long time dead slow through the ice, stopping the engines every few minutes until a "lead" through the ice should offer itself, the fog partially lifted for a moment, and allowed us a glimpse of Bear Island, to the S.W. of us. We then turned due south, and steamed in that direction for about thirty miles until we had cleared the ice, which we accomplished by about noon; then turned N.W. and saw Bear Island to starboard, distant about fifteen miles, when our course was once more altered to N., the fog clearing by degrees after we had left the ice. The surface-temperature of the sea, as taken by Mr. Chapman (11.30 a.m.) was 32° Fahr., the temperature of the air having been during the previous twenty-four hours, max. 39°, min. 32° Fahr. To the west of Bear Island an Eider drake was seen by Faussett, the only individual of this species seen during the day, I believe. About 12.30 saw a Richardson's Skua sitting on a hummock, and although I had a shot at it with a rifle it did not move, and appeared as if frozen there (though Kjeldsen, one of our ice-pilots, ridiculed the idea), or at least in a bad plight. This was the only Skua seen during the day. Shortly afterwards Chapman saw a Little Auk. About nine this morning a couple of Fulmars and a couple of Kittiwakes were shot by one of the passengers from the deck, the latter bird not being nearly so plentiful as the day before; the Fulmars during the afternoon were abundant all round the ship and very tame. Soon after 1 p.m. Chapman saw two adult Glaucous Gulls close astern; he also saw an Arctic Tern, which flew round the ship for some time, and tried to alight on the mainmast head, but did not like the vane. Several Little Auks seen during the day. Brünnich's Guillemots were flying past the ship so commonly, after we were out of the fog, that some of the passengers took up their position on the forecastle, with their guns, and had "sweeps" at them!

July 26th. Heavy sea, early morning; rain and thick. Sighted South Cape, Spitzbergen, 8 a.m. Little Auks beginning to get abundant. Brünnich's Guillemots common. A few Glaucous Gulls and Kittiwakes. No Skuas in morning. When off Horn Sound, seeing plenty of flocks of Little Auks,—a bird we were anxious to get specimens of in summer plumage,—and not knowing how easily we could get any number farther on, Chapman and I went off in a boat in pursuit; and I must bear witness to the good nature of our fellow-passengers, not one of whom, so far as I am aware, offered any objection to the consequent detention of the ship. Some ladies of the party produced fishing-tackle, and caught some large Cod over the ship's side. We were only away half an hour, and I only succeeded in bagging one Little Auk. We saw many in flocks, but they were rather wild, added to which there was a considerable, though short, "chop" on the sea, which rendered shooting from a small boat rather uncertain. We also shot some Fulmars, which were ubiquitous; one Brünnich's Guillemot; saw very many. A few Eiders, one or two Glaucous Gulls, and one Richardson's Skua were also seen. Some of the shooters on board had dropped a few birds into the water meanwhile, which we retrieved for them on our way back. Continuing up the coast, and passing the entrance to Bell Sound, about 5 p.m. we entered Is Fjord, and anchored at midnight in Green Harbour, as far in as the ice permitted. On our passage up the Fjord, Fulmars, Kittiwakes, Brünnich's Guillemots, &c., very abundant. Black Guillemots (= Mandt's Guillemots, *Cepphus Mandti*, Lichtenstein) began to get common up the Fjord.

July 27th. All the sportsmen of the ship landed in parties of four at 1 a.m. for a Reindeer hunt. The party to which I belonged proceeded first in a N.E. direction, but got separated, and Wolley and I, after fruitlessly endeavouring to force our way in that direction, returned to the low ground, and continued up a huge valley of unknown length, running nearly east and west, with mountains sloping down to it, from the north and south, and up which valley two other parties of sportsmen had got the start of us, which was the cause of our endeavouring to force our way in a different direction. Chapman got separated by going after three Ptarmigan, of which we caught sight on one of the crags a short distance ahead of us; he shortly afterwards found another single bird. He found them "all ridiculously tame, sitting among the loose rocks unconcernedly," while he "climbed within reach, and killed them all." They were all old cock birds. He only bagged two out of the four, the other two falling on to a crag which he could not scale, and lost much time in endeavouring to do so. The specimens obtained were moulting heavily—indeed I had never previously seen wild birds in such a ragged and dirty condition. Chapman describes these cock Ptarmigan as giving "a low call when lighting, a very weak imitation of the [Red] Grouse cock." Little Auks, and probably Brünnich's Guillemots, were breeding on a cliff-face a little way inland, at a height above the sea that we guessed at 1400 or 1500 feet. We observed Snow Buntings in pairs, but as we were bent on the pursuit of Reindeer we did not spend time in hunting for the nests of this or other species. We saw several pairs of Purple Sandpipers that were evidently breeding, and by whose nests we must have passed pretty close. Thomson, on the other side of the Fjord, found a nest of this bird this day containing four eggs, two of which were broken on the way back to the ship; the other two are now in Chapman's possession: the eggs are similar in colour to those of a Snipe, but are smaller. There were a few Kittiwakes up the valley; Eiders were rather numerous there, also Fulmars. We this day saw Ivory Gulls for the first time. I first saw a pair about five or six miles up the valley. Faussett, during the day, on the mountains running into the valley from the north, and many miles inland, noticed that on shooting a Reindeer, and proceeding to cut it up, Ivory Gulls speedily found it out, and congregated where none had been previously in sight. Chapman rejoined us after some hours' separation; he had bagged (besides the Ptarmigan) a couple each of Eiders and Fulmars and a Richardson's Skua, of which last species we had both seen two or three examples inland. Our scattered party having gradually reunited, we marched on until we were at an estimated distance of about twenty miles inland, when we separated into pairs, the better to stalk Deer, and ascended different mountains on the south side of the valley. Lowson, who was with me, obtained a Reindeer, the only one we saw. It was a buck, probably in its third or fourth year. It measured from tip of nose to tip of tail, 54 inches; height at shoulder, 32½ inches. In colour it was rather silver-grey, compared to the colour of Reindeer in Norway in summer. It was extremely fat, especially in the "gluteal region." Its horns were, of course, in the velvet, but, I think, almost fully developed. By the beach on the way back (10 p.m.) we put up two Grey Geese, which flew back almost over our heads. Chapman, who was the only one of our party carrying a shot-gun, was not loaded at the time, so they went on their way unmolested; still closer to the water's edge, a little farther on, were three Purple Sandpipers. The following birds were shot during the day in the Fjord by various gunners:—Eider Ducks, no drakes; Brünnich's and Mandt's Guillemots; Little Auks, Northern Puffins, Arctic Terns, one Glaucous Gull, one Purple Sandpiper, Fulmars, and Kittiwakes. On our way back to the ship, across the Fjord, in a boat that night, Chapman, who was facing forwards, observed an adult Red-throated Diver; I was sitting facing the stern, so only saw the bird from behind as it flew over us, and have no doubt, from the size, that it belonged to this species; at any rate, I could be sure it was a *Colymbus*. We arrived on board at 11 p.m., after a twenty-two hours' tramp.

July 28th. What with being a night's rest in arrear and not retiring this night until we had discussed, not only supper, but the various adventures of the different parties ashore, no one was up much before 1 p.m., so can say nothing about the birds passed during the morning; but the usual birds were about when at last we went on deck. We were then off the northern part of Prince Carl's Foreland, having left Green Harbour at 4 a.m. We put in to King's Bay about 3 p.m., but turned round and steamed out again without anchoring, as we understood that it was not a good locality for sporting purposes. We proceeded north to Magdalena Bay, where we anchored about 8 p.m. We found a schooner, 'Hvitfisken,' lying here, employed, as her name implies, in the White Whale "fishery." On going by boat to pay her a visit we found skins of White Whales floating all round her, which were left in the water as long as the ship remained in port, to get rid of as much of the blood and oil as possible. The next thing we noticed as we pulled round her counter was a leg of bear hanging over the stern, for want of a larder. Her crew had killed two bears in Bell Sound on their arrival there in May, and this was a joint belonging to one of them. The skins were on board in a cask of pickle, and were bought by two of our party. The deck, and everything on board was thickly coated with blubber, and it was quite difficult to keep one's footing in consequence. Swimming about amongst the White Whales' skins, quite close to the vessel's sides, and devouring the "spek" they thence obtained, were swarms of Fulmar Petrels. They were as tame as ducks in a farm-yard pond, and having borrowed a fishing-line and hook, and baiting with a scrap of blubber, we found we could catch them as fast as we liked. I possessed myself of three vigorous specimens, purposing to bring them home for the Zoological Society. With Lowson's assistance I got them safely on board the 'Pallas,' where one of the sailors told me I could just turn them down on deck in the waist of the ship, for they are quite incapable of rising off a flat surface like a deck, and this I found perfectly true; but unfortunately there was a gangway on each side in the waist, and these being opened the birds, when my back was turned, were quietly invited through them by some of the crew, so I lost them all, the men, I suppose, not caring for the extra trouble that would be incurred in deck cleaning. The 'Hvitfisk,' we were told, had a full cargo of 250 White Whales, said to be worth £1500 (I do not know whether this is correct or not), besides Seals and a lot of Eider-down. They catch both the White Whales and Seals in enormously strong nets, and kill them by putting a bullet into the head. We saw the net, which had not long since been hauled on board a sort of lighter, and on the top of it were lying two or three Ringed Seals, one of which I bought, as they had been drowned, and would therefore make a skeleton, which would not be the case with any we might shoot, in which the skull is always broken—besides the well-known fact that a bird in the hand is worth two in the bush. I was also given the skeleton of another one, minus the phalanges of the feet, which were retained in the skin, but this skeleton, together with some other osteological specimens, was thrown overboard on the passage to Bergen, after I had left the ship. There were a good many Glaucous Gulls about, all adults, of which we shot several. A large series shows a surprising difference in the size of individuals.

July 29th. Leaving Magdalena Bay at midnight, we proceeded northwards, past the west side of Danes Island, and rounding Amsterdam Island, we turned about N.E., until about 3 a.m., we were off Vogelsang, lat. 79° 55′ N.,—surface temperature of the sea (2 a.m.) 32° Fahr. There we were stopped by a field of ice, which, for all we could tell to the contrary, might be continuous to the Pole itself, and several degrees on the other side of it. The night was splendid, calm and clear, and brilliant sunshine. An Arctic scene such as we were then looking upon is incomparably more beautiful (in my opinion at any rate) than any bit of show scenery that I have ever seen farther south. We hereabouts saw Fulmars, numbers of Little Auks, Brünnich's and Mandt's Guillemots, a few Kittiwakes, and a couple of Puffins; also a few Seals, probably all *P. hispida*. At about 3.30 we turned round and started south again, and about half an hour later I turned in, so know nothing about the birds until 12.30 p.m., by which time we were again in Magdalena Bay, but found that during the forenoon we had passed a sloop which had two Polar Bear cubs on board alive, for which one of our party made a bid. Chapman's diary is as follows:—"Landed after breakfast, with Faussett, and commenced operations by bagging seven splendid mature Glaucous Gulls at one rise, also two beautiful Ivory Gulls. Ascended Rottge's Hill, a vast precipice, 2000 feet high, where millions of Little Auks, Guillemots (both sorts), Fulmars, Glaucous and Ivory Gulls breed, in hopes of eggs; but the breeding-shelves were inaccessible to man, and ever will be. To see the clouds of small sea-birds at so great an elevation was a wonderful sight; but their eggs were unattainable. Shot several specimens off the craig face at a 'dizzy height.' Next found a few Gray Geese breeding on a rocky slope above a morass, and secured five old birds (pink-footed), besides several young alive. Arctic Skuas, Rottges. Another party had gone up the Fjord by boat and bagged a lot of Eider Ducks, Glaucous and Ivory Gulls, Skuas, and the commoner sea-birds. We also found an old coffin disinterred by bears, with the remains of some poor whaler still inside. The steamer was now full of ducks and geese, Ivory and Glaucous Gulls, &c." In his summary of the birds seen, Chapman somewhat modifies the statement about the Ivory Gulls nesting, as follows:—"I think a pair was breeding at Rottges Hill, Magdalena Bay, but the craig was inaccessible, and all attempts to scale it were fruitless." The Little Auks, he told me at the time, were also breeding high up—up to the very top (say 2000 feet). Brünnich's and a few Black Guillemots were also breeding there, "also a pair or two of Ivory Gulls, and Glaucous," as I wrote it down at the time from his verbal account. Little Auks were carrying fish up, so doubtless had young hatched. Some Pink-footed Geese were observed flying about (probably three pairs), and on searching they found the young in down running about on the snow. Six young ones were caught, five being brought on board alive, but the last died within about forty-eight hours. At the bottom of the precipitous part of the mountain, at the top of the *talus*, was a very large quantity of their feathers and droppings, as if they had bred there and taken the goslings on being hatched to the bog lower down. Five old birds were killed (as before stated); two or three of them were unable to fly, the quill-feathers having moulted out. Snow Buntings seen, and a pair of Richardson's Skuas. No old cock bunting observed, but a brood of young ones below where the geese bred. Petrels as usual. There were scores of carcasses of White Whales stranded in the shallow water close to the shore, and although the skipper of the schooner we had seen in here on our previous visit was carrying home a skeleton for me to Tromsö (which I have since presented to the Oxford Museum), I thought I might as well try and get one for myself, but on landing and examining them I found that they were all imperfect, the bones of the flippers having been in every case cut away by the whalers in removing the skins. I had therefore to content myself with skulls (and nearly all of these were injured by a bullet having been fired into them). After a tedious job, I succeeded in beheading two and hauling the heads up on the beach, clear of the water. Fulmar Petrels and other birds were very abundant, and came very close to me as I was working at the whales' carcasses, and I was fortunate in shooting two brace of Ivory Gulls ; a pair of these fell into the water and one drifted away and was lost. While these birds were floating in the water nearly my whole time was occupied in keeping the Fulmars off them, and I had to continually throw stones at them ; I hit one flying at twenty or twenty-five yards distance, but even that did not much frighten him. I saw some of the others in a boat; a little way farther up the Fjord shot several Glaucous Gulls, of which there were a good many about. At night the steamer again moved southwards.

July 30th. At 1.30 a.m. the steamer stopped, and a boat put off to a haunt of geese. Chapman was one of the party, but they only saw one lot of geese (Gray) arrive, just as they were leaving. The "loomery" at which they landed he describes as "truly a wonderful sight; millions of Auks, Guillemots, Dovekies and a number of Skuas, Glaucous and Kittiwakes breeding in a high craig." Here we saw a fox. I spent most of the morning in skinning my seal, an operation which I have seen described somewhere—I think in Captain Markham's 'Whaling Voyage to Baffin's Bay,' but cannot find the reference—as having been performed by a professional sealer in less than a minute! Certainly none of our crew whom I saw skin seals—and several of them were old Spitzbergen hands—had acquired this rapidity. Flensing a seal is not a nice occupation for cold weather; the "spek" of the Ringed Seal (in these latitudes and at this time of year) is about two inches thick all over the body, and is removed with the skin, which is then held over a board and the spek shaved off with a long, sharp knife, kept on purpose. The blubber is then put in casks. The skins having been rubbed with salt and alum we packed away in pickle-tubs, according to the Norwegian fashion, but it is not a good plan. Blubber and seal flesh are very different matter to the corresponding substances of land animals; the blubber cannot be stripped cleanly off the flesh, which is of a flabby consistency, and altogether the operation is much more troublesome and dirty than the skinning of any land animal of which I have had experience. We were off Is Fjord about 11 a.m., but found it completely blocked by ice, so continued south and reached Bel Sound about 4 p.m, and anchored in the harbour on the south side of Middle Hook, just to the east of Separation Point, the position of which was ascertained to be lat. 77° 38′ 20″, long. 14° 52′ 30″ E. I went off with a party in a boat in a south-east direction, past a cliff on which were quantities of Kittiwakes and Glaucous Gulls, Guillemots, Little Auks, and a few Puffins; whether they were all breeding there I cannot say. As we were passing, a short distance off the cliff, I observed a Little Auk fly to and catch a Gull's droppings, before it had fallen many yards. We landed immediately beyond this cliff, where there was just standing room between the cliff and the sea; one of the party here found an adult fox, dead; I suppose it had missed its footing when hunting high up; I kept its skull. We landed again a little farther on, at the mouth of a small river, where the mountains receded a bit from the shore, leaving a sort of amphitheatre, with perpendicular sides, and sloping gradually and irregularly upwards towards the back. As we came to land, we saw about three Purple Sandpipers close down to the water's edge, by the mouth of the river (the tide was about full), of which we shot a couple; and later on ten or a dozen more were obtained. Observed a pair or two of Snow Buntings, one of which was shot; and also saw two or three Richardson's Skuas. I walked a little way inland, but found bird life almost entirely absent. There is a "loomery" on the cliff forming the west boundary of the "amphitheatre"; the birds breed (chiefly at any rate) on the east face, and not on the south, which is the one facing the sea. It is, I suppose, the bird cliff that Chapman (who was in another boat) mentions—"He went ashore and visited a huge 'loomery,' but saw no interesting birds; all quantity, no quality." In the evening a Ringed Seal swam up towards the ship, apparently out of curiosity; it was greeted with a salute of three rifles, one of which took effect, but not killing it. Seeing this, I jumped into a boat lying alongside, followed by one of the other passengers, without waiting to take any weapon, and we rowed away in chase as hard as we could go. After a smart pull we overtook it, and got close to it, well within gun-shot, but having no offensive weapon we might as well have been miles away. We followed it, however, hoping that it would get spent and allow us to capture it somehow; we were often close to it, but never within reach; it led us northwards, round Separation Point, and a good evening's work we had before we were again on board the 'Pallas.' Still later in the evening, Chapman, when some miles up the Sound in a boat, saw a bird, which he thus notices:—"Observed a large long-winged falcon, soaring high over the water . . . ; appeared to have a short tail." A large gull will sometimes look very like a bird of prey when soaring quietly high in the air, but Chapman, to whom I suggested this, was sure this was no such bird, nor is he likely to have been so mistaken. Faussett and Woolley were with him at the time, and fully believed it to be a falcon. Dr. Malmgren * mentions that a large falcon was observed on two occasions by some members of the Swedish Scientific Expedition, which visited Spitzbergen in 1861, under Nordenskiöld and Dunér. Professor Newton ('Notes on the Birds of Spitzbergen,' Ibis, April, 1865, p. 227), says of this:—"I can find no other record of the appearance of any of the *Falconidæ* in Spitzbergen." On this occasion Chapman saw several large seals, which may probably be referred to *P. barbata*.

(To be continued.)

ORNITHOLOGICAL NOTES FROM LOWESTOFT, SUFFOLK.

By Henry Stevenson, F.L.S.

I can fully endorse the remarks of Mr. J. H. Gurney, jun., in 'The Zoologist' for 1880 (p. 22), as to the advantageous position of Lowestoft, geographically, for observing the migration to our eastern shores in late autumn of birds which, in former days, were commonly regarded as residents only. The regular influx, for example, in October, of Starlings, Rooks, Larks, Chaffinches, Tree Sparrows, Greenfinches, &c., affords, day by day, to the ornithologist a ceaseless interest as he watches, glass in hand, the passage of these birds, in large or small flocks, skimming low over the waves till they reach the beach, then rising as they approach the cliffs and houses, and passing inland with untired flight. To these, also, succeed our usual winter visitants,—Snow Buntings, Hooded Crows, Twites, Redwings, Fieldfares, &c.; Raptores of various kinds, and stragglers, more or less rare, and worthy of notice.

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* Anteckningar till Spetsbergen's Fogel-Fauna. Af A. J. Malmgren. Ofversightaf Kongl. Vetenskaps-Akademiens Förhandlingar, 1863, p. 113. *Id.*, 1864, p. 411. Quoted by Professor Newton in his 'Notes on the Birds of Spitzbergen,' Ibis, April, 1865. I have not seen the original.

The neighbourhood itself is particularly attractive to the feathered tribe, with its long range of furze-covered hills and grassy denes to the north, stretching away towards Yarmouth and its far-famed Breydon. In the background, as it were, but in close vicinity, Oulton Broad, with its surrounding marshes and beautiful lake, and still used decoy at Fritton and Herringfleet; whilst, on the other hand, the cliffs of Pakefield and Kessingland trend southward, to Sole Bay and Eastern Broad, a snug retreat for fowl, where many a rarity has been obtained by local gunners. The whole sea-board, therefore, in all but the summer months, has special attractions for the ornithologist, as well as sportsman, and it is much to be regretted that there is no resident naturalist, with leisure sufficient, to make the necessary observations,—for which this spot affords such great facilities,—and preserve to us a record of the same from year to year.

The following notes, for the year 1880, have been chiefly supplied me by my friend Mr. Frank Barton, temporarily located at Lowestoft, who happily combines a discriminating power of observation with a sportsman's relish for the pursuit of wild birds.

Avocets.—One morning, about the middle of August, Mr. Barton was bathing off the beach, and having swam out to a sand-bank was just able to stand there, being low water. As he rested two birds, which he took at first for small gulls, from their white breasts, flew towards him, and as they passed over his head he noticed that their plumage was black and white, and their bills long and curved upwards. On examining an Avocet in my collection, shortly after, he quite confirmed his impression at the time that these birds were Avocets. They were flying in the direction of Southwold.

Sanderlings.—On the evening of the 19th of September I saw a flock of eight Sanderlings flying low over the sea, not far from shore, in the direction of Pakefield.

Swift.—A single bird was seen at Lowestoft as late as the 21st of September, probably the same straggler seen two days before in the same neighbourhood.

Purple Sandpiper.—About the first week in September a bird of this species was shot near Yarmouth, and having been preserved was shown to me on the 25th. Another was killed on the beach at Lowestoft by Mr. Barton on the 26th of November.

Kentish Plover.—On the morning of the 27th of September, about 6.30 a.m., Mr. Barton, when on the north beach, observed some birds running rapidly along the margin of a brackish pool of water, near the fishing pier, and from their size and actions, though varying somewhat in colouring, took them for the ordinary Ring Plover. As he was watching them a shore gunner came up who shot at, but missed, them, and this man told Barton at the time they were Kentish Plovers, as he had met with the same kind before. Examples of this species, which I showed Barton shortly after, did not quite settle the point in his mind; but some weeks later, happening to meet the same gunner, he told him that in the afternoon of the 27th of September he went again to the same spot in search of the birds, and succeeded in shooting one. This he had stuffed; and on showing it to Mr. Barton it proved, as the man had said, a true Kentish Plover. When first seen these birds were running about at a great pace, constantly thrusting their bills under tufts of grass, and retreating as if extracting something; and as they took wing they uttered a plaintive cry of two notes.

Migration of Finches, &c.—On the 27th of September, at the same time as the Plover, Mr. Barton also observed, on the beach and north denes of Lowestoft, flocks of Grey Linnets, Sky Larks, Siskins, Pied Wagtails, and Wheatears. Single Wheatears were also seen on the denes on the 8th and 9th of October.

Solitary Snipe.—One, brought to a Lowestoft bird-stuffer on the 9th of September, had been killed close by; and another was shot in the marshes at Carlton Colville on the 17th.

Red-throated Diver.—About the 20th of September, Barton purchased a good specimen, still retaining the red throat.

Honey Buzzard.—In the last week of the month Mr. Freeman, of Lowestoft, had sent him to stuff a Honey Buzzard, shot at Wangford.

Terns.—A flock of these birds were seen off Lowestoft on the 2nd, and again on the 9th, of October.

House Martins.—Nine or ten together were seen early in the morning of the 9th of October, flying direct out to sea. Four young birds still frequented the esplanade up to the 18th of November.

Shore Larks.—On the 15th of October Mr. Barton sent me a Shore Lark, one of two he had met with that morning on the north beach; and on the 26th a pair were shot on the Lowestoft denes.

Snow Bunting.—Very large flocks frequented the shore and denes about the middle of November, and on the 18th Mr. Barton saw one perched on a tree at Lowestoft, almost in the town, and one then flying round it.

ORNITHOLOGICAL NOTES FROM NATAL.

By Majors E. A. Butler and H W. Feilden, and Capt. S. G. Reid.

(Continued from p. 303.)

Mirafra africana, Smith, Rufous-naped Lark.—Reid procured two specimens of this bird near Pietermaritzburg, one on the 20th April, and another on the 5th December. Also a male, developed for breeding, at Blaauw Krantz, on the 23rd November. The last-named made a curious flapping noise in flight, perching on the tops of the high bushes..

Macronyx capensis (Linn.), Orange-throated Lark.—Universally distributed and extremely common. Besides its peculiar "mewing" cry, it has a rapid, spasmodic, but not unpleasant song, which it utters only when on the wing, and which is apparently confined to the breeding-season. Never seen in flocks. Fresh eggs were taken in October and November. A nest found by Butler on the 9th November near the Ingagane River contained two eggs, incubated, white, well marked with dusky spots.

Anthus caffer, Sundev., Cape Pipit.—Common at the Ingagane River, near Newcastle, where Reid obtained four specimens in June and July, feeding on the bare patches round the stone cattle "kraals." He also met with it near Ladysmith in November, and obtained the eggs from two nests on the 18th and 19th of that month. The nests were cup-shaped, well concealed among the growing herbage, and resembling those of our common European Meadow Pipit. The eggs in the first nest, three in number, are white, with distinct freckles and small blotches of chocolate-brown, and a more obscure series of ashy grey markings, most numerous towards the larger end, measuring ·8 in. by ·6 in. In the second nest the two eggs have the markings smaller, but more numerous and of a slightly duller brown. Iris brown; bill brown, with the basal portion of the lower mandible flesh-colour: legs and feet yellowish clay-colour (R).

Anthus pyrrhonotus (Vieil.), Red-eared Pipit.—This species is the *A. sordidus* and *A. leucophrys* of Layard's first edition. It is an exceedingly common bird on the "veldt" in the upper portions of the colony, and we obtained many specimens. Several nests were taken near Newcastle and Ladysmith. From Butler's notes we extract the following:—"Found a nest near Newcastle, on the 1st October, under a tussock of grass. It was well concealed, and composed of dry grass, lined with finer material of the same description, cow-hair, horse-hair, &c., with a run up to it on one side, so that it was necessary to stoop down very low to see into it. Eggs three in number, fresh, white, spotted all over with grey. Another nest, precisely similar in composition and situation, at Sunday's River, on the 12th October, containing three eggs slightly incubated. One specimen, shot near Newcastle on the 23rd June, was pied, having the greater part of the head and neck and other parts of the body white" (B).

Anthus Butleri, Shelley, nov. sp., Yellow-breasted Pipit.—Feilden shot the first specimen on the 6th June, and Reid met with it at the Ingagane River in July, and obtained three specimens. Butler afterwards obtained a fine male, nearly in full plumage, on Nov. 9th, at Newcastle, where it was by no means common. Those obtained at the Ingagane were very local, and only to be found on one particular open flat near the main "drift." In their movements and flight they much resembled Wagtails. Iris dark brown; upper mandible, and tip of lower, neutral tint; base of lower mandible purple flesh-colour; legs and toes light yellowish brown (R). For a description of this interesting new species we must refer our readers to Capt. Shelley's paper, in the 'Proceedings of the Zoological Society,' March, 1882. Butler adds the following notes referring to his type specimen:—"Legs and feet brownish flesh; bill horny-brown above, lavender below; iris dark brown." He also notes that it is a bird of skulking habits, seeking concealment in the grass much more than the other Pipits, especially when pursued, lying close, and being consequently often difficult to flush a second time.

Motacilla capensis, Linn., Cape Wagtail.—Everywhere abundant inland, but not so numerous, apparently, in the neighbourhood of the coast. A graceful, lively bird, with an extremely pretty little song, not often heard. Nests were found in September, October, and November, built on the banks of streams or dry "dongas," among overhanging roots, or under projecting stones; they are cup-shaped, neatly and massively constructed of dry grass, lined with fur and cow's-hair. The eggs, three in number usually, are brownish cream-colour, very indistinctly freckled with brown, and very slightly glossed; ·85 in. by ·55 in.

Motacilla vidua, Sundev., African Pied Wagtail.—One seen and obtained by Reid on the edge of a sluggish stream near Colenso, on the 20th November, where Butler also observed a pair on the banks of the Tugela. Several pairs seen, and a specimen procured, at the mouth of the Umgeni, near Durban, on the 24th December (R). Not observed in the neighbourhood of Newcastle.

Columba phæonota, Gray.—This handsome Pigeon, which is most excellent eating, abounds throughout the hilly country in the north-west of Natal, roosting on ledges in the steep "krantzes," and descending to feed on the lower grounds in the roads and "out-span" places, where windfalls of scattered "mealies" are met with, and in cultivated land. They are very strong on the wing, and, like most Pigeons, require a deal of hitting to bring them down. Young birds have the white spots on the wing-coverts less pronounced than the adults, and they want the ruddy vinaceous feathers of the neck and breast; iris dirty white, or cream-colour; bill and bare skin round the eye cinereous; legs reddish brown. Old birds have the iris reddish pink, or sometimes cream-colour, with an outer ring of reddish pink; bill, &c., as given by Layard. It is worthy of note that an egg of this bird was found on a ledge of rock at the Ingagane River in mid-winter (July)! Butler also found a nest containing a single fresh egg on the 9th October. Can it breed twice?

Œna capensis (Linn.), Black-throated Dove.—Not observed at Newcastle, but extremely common at Ladysmith, and also found at Blaauw Krantz River in November. One kept as a pet, by a Sergeant of the Welsh Regt. at Ladysmith, was rescued by him, with one or two others, from some Kaffirs who were about to throw them alive into the fire to cook them, having merely pulled out the tail and wing-feathers! (R).

Turtur capicolus, Sundev., Cape Turtle Dove.—Common everywhere. Fresh eggs were taken in the Newcastle district on the 23rd October, and at Richmond Road, near Pietermaritzburg, on the 7th December. The nest is, like that of the common European bird, a slight construction of twigs, through which the eggs can plainly be seen from below. The eggs measure 1·08 in. by 0·87 in. This species is the *Turtur semitorquatus* of Layard's book.

Turtur senegalensis (Linn.), Senegal Turtle Dove.—Only met with in the mimosa bush along the Tugela River, at Colenso, in November. Reid found them common here, and obtained specimens.

Tympanistria tympanistria (Temm.), White-breasted Wood Dove.—Several seen, and one obtained in the thick bush near Durban on the 26th December (R).

Numida coronata, Gray, Guinea-fowl.—Though not obtained within the Newcastle district, this fine bird occurs in considerable numbers in places, as at Estcourt, Ladysmith, &c. As many as seventy have been seen together near the latter town, and it is no uncommon thing for a man with a good dog to bring home five or six. Reid met with them, and shot one at "Guinea-Fowl Kop," near Ladysmith, in August. As its name implies, this hill is a noted resort of these birds.

Francolinus levaillanti, Temm.—This is the only Francolin we obtained near Newcastle. It is not very numerous, but widely distributed. We heard of another kind at the top of the Drakensberg, but were unable to investigate the matter. We found it almost impossible to flush these birds a second time without dogs, though we had marked the spot where they settled to an inch!

Francolinus gariepensis, Smith.—A pair seen and the female obtained by Reid on the banks of the Tugela, near Colenso, on the 21st November. Iris reddish brown; legs yellow; bill yellow, with the culmen and tip of upper mandible horn-colour. Eggs slightly enlarged in the ovary.

Coturnix communis, Bonn., Common Quail. — Without attempting to explain the migrations of this well-known bird, as far as Natal is concerned, we will merely give in detail the various occurrences that came under our notice. Reid saw five at Sunday's River on the 6th May; Lieut. Giffard saw one near the Leo Kop Mountain on the 9th July; Butler shot one near Newcastle about the same date; they appeared in considerable numbers in the district early in October, when many specimens were obtained; and in the Maritzburg country they were simply swarming in November and December. As many as one hundred couple were shot here in one day by a party (though they were breeding abundantly at the time). On the 2nd December Col. Russell, 14th Hussars, informs us, his dogs flushed two sitting birds from nests containing eggs. Are these the birds that breed in North Africa and the South of Europe in the summer months? If so, how is it that the thousands of birds that visit India in the cold weather do not breed there? In one case it looks as if they bred twice in the year, and in the other as if they only bred once.

Turnix lepurana (Smith), Hottentot Button Quail. — Only once obtained in the neighbourhood of Newcastle by Feilden, in August, though frequently seen. Observed also near Ladysmith. Lieut. Giffard shot several when quartered at Pinetown.

Struthio camelus, Linn., Ostrich.—Still found wild in limited numbers on the Buffalo Flats near Newcastle, where Feilden observed a small flock in the winter. Reid saw a single bird on the plains between Dundee and Rorke's Drift in October. Butler and Reid came across some broken fragments of egg-shells on the veldt near the junction of the Ingagane and Buffalo Rivers, in October; the undoubted remains, according to a sporting Boer farmer who was accompanying them, of a former nest. In a domesticated state they are now to be met with in numbers throughout the colony of Natal, where Ostrich-farming is rapidly becoming popular.

Otis kori, Burch., Kori Bustard; Gom-Paauw.—Common in the more open country between the Buffalo and the Drakensberg, but not obtained in the immediate vicinity of Newcastle, where its place is taken by *E. ludwigii* Feilden killed a fine pair, right and left, in the Leo Kop district. Several were obtained near the Leo Kop Mountain and on the Buffalo Flats. Reid found them plentiful in the former district, and they undoubtedly breed there, as well as between the Ingagane and Dundee.

Eupodotis ludwigii, Rüpp.—Not a scarce bird on the undulating hills near Newcastle, where it breeds, and we all obtained specimens. Female, iris greyish brown; bill blackish horn-colour, inclining to white towards the base of the lower mandible; legs and feet whitish green (B). The crop of one shot by Feilden contained beetles and grasshoppers. A hen bird, developed for breeding, shot on the 6th October, weighed 7½ lbs., and measured as follows:—Length 32½ in.; wing 19 in.; tarsus 10 in.; bill from front 2½ in., from gape 3⅛ in.; expanse of wings 62¼ in. (B).

Eupodotis cærulescens (Vieil.)—The commonest Bustard, in fact the only small kind observed, from Ladysmith to Newcastle. Butler was singularly successful in out-manœuvring them, and killed a good many. Specimens were obtained by Reid at Sunday's River, and he was shewn a beautiful pair, just killed near Ladysmith, in August. These birds are often seen on the veldt close to the main road, taking very little notice of passing waggons. A young male obtained by Feilden had its crop full of insects, chiefly beetles. "They are wild, as a rule, and difficult to approach if you walk straight towards them; but by walking away from them at first and then gradually circling in towards them, especially if there are two guns and each goes a different way, you can almost always get within shot of them as they squat, even when there is little or no covert, when they see that they are surrounded, and allow you to walk up to within a few yards of them before they rise. When they get up they utter a harsh note, resembling the words 'kuk pa-wow,' repeating the call several times as they fly away. We found the above plan of stalking also successful with the preceding species" (B).

Œdicnemus capensis, Licht., Cape Thick-knee; "Dikkop."—Met with commonly near Newcastle, on stony flats or slopes among the low hills. Specimens shot in May and June had the iris, bill, and legs all yellow, except the tip of the bill and the front of the legs, which were greenish (R).

Cursorius burchellii, Swains., Burchell's Courser.—Extremely common all over the veldt, in pairs and in small flocks. Apparently breeding in November, but no nest was found. On the wing they look somewhat like a Turtle Dove.

Cursorius chalcopterus, Temm., Bronze-winged Courser.—One was obtained by Reid at Colenso, on the 20th November, in thick dwarf mimosa bush, to which it kept close. Female, iris dark brown, eyelid thick and orange-scarlet; bill black, base of lower mandible reddish crimson, gape scarlet; legs crimson-pink, toes blackish (R).

Cursorius senegalensis (Licht.), Senegal Courser.—Reid met with several small flocks on the flats near the Tugela River, at Colenso, and obtained specimens on the 21st August.

Glareola melanoptera, Nordm., Black-winged Pratincole.—Observed in large flocks by Feilden on the way up country in March. A pair, seen by Butler and Reid near Newcastle on the 19th October, were the first noted in the spring. In November they were most abundant, in flocks, in the neighbourhood of Ladysmith and Colenso, and numerous specimens were obtained on our homeward march down country.

Hoplopterus coronatus (Temm.), Spur-winged Plover; "Kiewit."—This noisy bird is everywhere abundant on the "veldt," in small flocks. No nests were found, though it was evidently breeding in October and November. An immature bird, shot near Estcourt on the 24th November, had the iris lemon-yellow, eyelid light crimson; bill dark purple, almost black; legs dark purplish, toes blackish; the nape and hind head greyish; forehead, chin, and throat yellowish white; top of head mottled with grey and brown, showing no sign of the black patch (R). They are very good eating (B).

Ægialitis tricollaris (Vieil), Three-banded Sand Plover.—Abundant in all the vleys throughout the colony. Not seen in flocks; more than three or four were seldom seen together. One shot on the 14th May—a female with eggs much enlarged—had the iris light brown, eyelid bright scarlet; bill flesh-colour at base, black at tip; legs brownish flesh-colour (R). A male shot by Butler on the 26th June, also developed for breeding, had the eyelid scarlet; legs and feet yellow-drab or buff; bill coral-pink at base and black at tip; iris brown (B).

Ægialitis marginatus (Vieil.), White-fronted Sand Plover.—Several small flocks seen by Reid on the beach outside Durban Harbour on the 25th August, and two, male and female, obtained. Also seen by him in the same place in December.

Charadrius asiaticus, Pall.—There were a good many of these

Plover about at the mouth of the Umgeni, near Durban, on the 26th December. Some boys who were shooting there on that day had obtained several, and presented one to Reid.

Laomedontia carunculata (Gmel.), Wattled Crane. — Not so numerous as the two following species, but seen occasionally, in pairs, in the Newcastle district. Though shy, if is generally possible to ride up to within a hundred yards of these stately birds before they take wing. We never attempted to shoot them, but a specimen was obtained close to Newcastle in the spring.

Grus paradisea, Licht., Stanley Crane. — These graceful Cranes are very common on the "veldt" all about Newcastle in pairs and small parties. We are unable to give particulars of their breeding habits, but Butler and Reid, when searching for their nests in "vleys" or marshy places, were informed by an old sporting Boer farmer that they scratched a hole and laid their eggs, like a Bustard, on the open veldt, and never constructed nests in the "vleys," like the other cranes. He described the eggs, also, as being of the usual Crane type, and nothing could shake his evidence. Unfortunately no nest could be found, though he did his best to find one, galloping hither and thither over the "veldt" on his well-trained pony after every pair of birds he could see, and searching carefully for young ones in the patches of weeds and rank grass. The question, therefore, must await further investigation, though we are strongly inclined to believe in the Boer's account. Bill, in this species, yellow-ochre, with a tinge of red; iris dark brown; legs black. A female examined by Butler measured 43 in. in length; wing 38⅞ in.; tarsus 9½in.; bill from front 3¼ in., from gape 3¾ in.; expanse of wings 52½ in.; slightly developed for breeding (B).

Balearica chrysopelargus (Licht.), Crowned Crane.—Observed frequently in the more open veldt, generally not far from a "vley" or marshy spot. Appears to breed in the neighbourhood of Newcastle, though no nests were found. Reid constantly met with a family party of five near the Ingagane Drift in June and July, and one night, when waiting for ducks, obtained an adult female and two immature birds. The iris of the adult bird is bluish white, bill and legs black. "The total length of the female abovementioned was only 3 ft. 4 in., yet Layard and Tegetmeier give 3 ft. 8 in. and 3 ft. 9 in. respectively. Is the female smaller than the male? Called 'Mahem' by colonists, from their note; but

I was squatting in a vley within ten yards of a party of them for a quarter of an hour, and after listening to their notes all this time I could only make these out to resemble 'aan-aan—nor-aan,' uttered very softly and plaintively" (R).

Ardea goliath, Rüpp., Goliath Heron.—Butler and Reid had the good fortune to meet with this grand Heron nesting in a remote vley near the junction of the Ingagane and Buffalo Rivers, just over the Transvaal border, on the 17th October. As the account may be of some interest, we venture to transcribe from Butler's notebook as follows:—*Ardea goliath*, male; length 5 ft.; wing 25½ in.; tail 8½ in; bill in front 7½ in., from gape 10 in.; expanse of wings 7 ft. 3½ in.; legs and feet black; bill slaty black; iris bright yellow; orbital skin plumbeous. Nest with three fresh eggs situated in the centre of a vley, and placed upon the top of a patch of green sedge beaten down by the wind and rain, and raised some two feet above the level of the water; composed of dry sedge and reeds, and lined with dark-coloured sedge and a species of creeping weed—very flat and about two feet in diameter. The old bird raised himself off the nest as we approached, and walked slowly away, erect, for a few yards before taking flight; and, after remaining away for a few minutes, returned to the nest, when an unsuccessful long shot prevented him from settling. He only flew, however, for some 500 or 600 yards, and after a careful stalk we winged him; on being wounded he became excessively savage, tearing up the grass with his enormous bill and showing every inclination to fight to the last, so we had to despatch him with a charge of small shot. The female was not observed near the nest, though, oddly enough, another Heron, *Ardea cinerea*, was feeding within a few yards of it on our first approach. Eggs of the usual Heron type, bluish green, without gloss, nearly oval and equally pointed at both ends, 2·8 in. by 2·0 in. Rather a small egg for such a large bird, though considerably larger than the eggs of *A. cinerea* (B). One seen by Reid at Calleba's Laagte on the 15th November, very shy, and quite unapproachable.

Ardea cinerea, Linn., Common Heron.—Frequently met with, singly, in the vleys round Newcastle; always very shy. Not found breeding.

Ardea melanocephala, Vig. & Childr., Black-necked Heron.—Feilden obtained a female specimen at the Ingagane River on the

6th June, and Butler noted several other specimens shot in the same locality. Probably often mistaken for the preceding species.

Ardea purpurea, Linn., Purple Heron.—Occasionally met with in quiet, unfrequented vleys. Butler and Reid found a pair at a large reedy vley, on the Natal side of the Buffalo, on the 19th October. No nest was discovered, but they were probably going to breed there.

Ardeola bubulcus (Savig.).—One obtained by Lieut. Giffard near Newcastle, in the summer months.

Herodias garzetta, L.—White Egrets are a familiar feature in all the less frequented vleys in the Newcastle district. They are uncommonly shy. Butler and Reid found a small colony apparently breeding in October, but could not discover the nests.

Ardetta pusilla (Vieil.), South African Little Bittern.—Seen on the march up country, at Richmond Road, in February (B).

Botaurus stellaris (Linn.), Bittern.—By no means uncommon in the reed-grown vleys in the Newcastle district. Four or five were sometimes seen in the course of a day's shooting. Specimens obtained in September showed unmistakable signs of breeding, but no nest was met with.

Nycticorax griseus (Linn.), Night Heron.—Butler examined a specimen in the flesh, in immature plumage, that was shot near Newcastle by an officer of the 97th Regt.; but we did not come across it ourselves, so that it must be uncommon in the tract with which we are dealing.

Scopus umbretta, Gmel., Tufted Umbrette; Hammerkop.—A common bird in vleys and along sluggish streams; by no means shy. Four fresh eggs were taken from a nest at Calleba's Laagte by Lieut. Giffard, on the 30th May. Eggs were also taken by Lieut. Harkness near Ladysmith in October, and on the 21st November Reid found a nest near Colenso, containing an egg on the point of hatching and three young birds just out of the shell. It would appear from this that they, like many other South African birds, breed twice, winter and summer, if not all the year round. Butler adds the following note:—"Numerous nests about Newcastle all through the cold weather; they are huge stick structures, domed, with the entrance on one side, and usually placed upon a rock overlooking a running stream or waterfall, sometimes only three or four feet above the water, though usually higher. The only egg I procured—as the nests were invariably destroyed by soldiers from the camp before the eggs were laid—was one from the nest taken by Lieut. Giffard, previously alluded to. This is decidedly small for the size and class of bird, of a chalky white, or pale straw when held up against the light" (B). The egg found by Reid was much larger than those in Lieut. Giffard's nest, measuring 1·88 in. by 1·41 in. One of the latter in his possession measures only 1·63 in. by 1·19 in.

Platalea tenuirostris, Temm., South African Spoonbill.—First seen by Butler, a single bird being noted by him near Newcastle on the 18th September. Afterwards occasionally observed in the "vleys"; and a small colony were found breeding by Butler on the 1st October, in a thick reed-bed near the Buffalo River, on the Transvaal side, of which he furnishes the following note:—"Found a small colony of Spoonbills, five or six pairs breeding in a bed of bulrushes growing in a 'vley' near Newcastle, on the 1st October, 1881. Nests large, composed of sedge, being built just above the level of the water and placed within five or six yards of each other. All contained young birds, either two or three in number, almost ready to leave the nest, except one, which contained three nearly fresh eggs, white, richly marked with chestnut-brown. The parent birds evinced great anxiety for their young as they hopped out of the nests, on my approach, into the water, flapping their wings and trying to swim, and descended on to the nests fearlessly within a few yards of me. In the old birds, as far as I could see, the legs and feet were red or pink (not black, as in *P. leucorodia*), and the young birds were white, with black tips to the primaries; bill livid grey; legs and feet grey. Not bad eating. The bulrushes, in which the nests were found, were growing in water about three or four feet deep."

(To be continued.)

THE INCUBATION OF SERPENTS.

By Arthur Stradling, C.M.Z.S.

Since the word "incubation" has an extended application beyond its literal meaning, let me premise that in the course of this brief account I shall use it only in its most limited signification—the act of an animal covering its eggs with its body after their extrusion.

On the 13th of July a common Ringed Snake (*Tropidonotus natrix*) in my small reptilium laid fourteen disconnected eggs. A few others were deposited both before and after the batch at intervals of several days, but these were all apparently either immature or addled; the fourteen being plump, perfect eggs, with the membranous envelope distinct and well formed. I inferred from the snake's uneasiness and restless wanderings about the cage on the night of the 12th that deposition was about to take place, and that she was seeking an eligible spot for the purpose; accordingly, I introduced a small open box filled with moss into the case, and on taking a last look before retiring about 2 a.m. I observed her lying quietly therein. Six hours later, however, I found her coiled on a pyramid of eggs in a distant corner of the cage, encircling and surmounting them in such a way as almost to conceal them—snake and eggs forming a sort of cone. She had deserted the moss, and had so cleared away the gravel where she was lying that the eggs rested on the wooden floor: this had probably occurred as soon as the morning sun struck that part of the cage.

Looking upon this position as indubitable evidence of an intention to incubate, I commenced to take observations of the temperature at once, and continued to record them regularly every four hours until her desertion of the eggs six days afterwards, making also frequent trials between these periods so that no unexpected exacerbation or development of other phenomena might escape notice. I employed for the purpose three carefully tested clinical thermometers, and as far as possible made use of *all* the surroundings as standards of comparison—the woodwork, gravel, the air inside and without the cage, and the other snakes—in order that the degree of retention and subsequent evolutions of heat derived from the direct sunshine in every case might be allowed for in calculating external influences. The temperatures which I have preserved as reliable were all taken between the coils or in the centre of the mass, those obtained by the mouth and anus being attended with so much disturbance that I hesitate to consider them trustworthy. The results of these experiments may be epitomised as follows:—There was a *minimum* elevation of 1·8° (Fahrenheit) above the surrounding atmosphere and objects, to be observed as constantly at the warmest hour of the day, when the sun was pouring full upon her, as in the middle of the night. But for some time after the sun had passed off, and long after the temperature of even those snakes which had been lying in its direct rays and had not moved from their place had fallen to that of the air, and the stones, glass, and boards were cold again, there was a remarkable retention of heat—never rising above what had been lost, but sinking so slowly that it was sometimes nearly two hours before that of the surroundings, *plus* 1·8°, was reached. Thus, after all deductions were made, an *apparent* maximum of 4·6° was gained. I was entirely at a loss to account for this at first, and was unable to work the matter completely out, even by the end of the six days; and I regret for this reason more than for any other the stupid interference which put a stop to the incubation. I am almost certain, however, that it was due simply to a storing of the external heat in the eggs, this evaporating slowly afterwards through the mal-conductive membrane and the body of the snake; and that such apparent retention or maximum elevation was purely passive and mechanical. I therefore believe that 1·8° was the highest intrinsic or vital increase which the reptile exhibited. Perhaps I should have explained that the cage was not provided with any artificial heating apparatus, but that the sun shone upon it from about six to ten a.m.—if it shone at all; very luckily this happened to be the finest part of the day about that period. Beyond this, the cage had only such warmth as a dwelling-room at this time of the year affords, its inmates being hardy European and North American Colubers of several species.

There could be no doubt of the little serpent's energy and definite purposeful determination in its object. She was a rather small specimen, and though thin and weak she did not leave her charge for a moment, but resented disturbance most strenuously; she drank a little water which I presented to her in a saucer, but would not go to the bath, nor was she to be tempted with frogs. On several occasions she bit my hands as I busied myself about her with the thermometer; and I think that those who are familiar with the habits and characteristics of this species will agree with me that such an action is no less phenomenal than the rise of temperature, and that it may be looked upon as indicative of the intense revolution which the reptile's whole nature must undergo at such a period. I have never witnessed or heard of such a proceeding on the part of this singularly harmless creature before; and that close observer, the late Mr. John Keast Lord, says, "From oft-repeated experiments, I feel sure that it is impossible, by any amount of provocation, to induce the Ringed Snake to strike or make any attempt to bite." Mr. Lord, of course, had not made his experiments with an incubating Snake, but it is difficult to find a reason for their never biting under ordinary circumstances, as they certainly have the wherewithal to a comparatively formidable extent, and are prone to excessive timidity. My little *natrix* seemed not to object to the other serpents passing over her; but, unfortunately, she lay in an angle, and as many of them were much larger than herself, they frequently displaced her and scattered the eggs by forcing themselves between her folds and the side of the cage. After such an occurrence she appeared to make some effort to collect the eggs together once more in a compact mass, throwing her body around the outlying ones, and perhaps constricting the coil a little so as to draw them towards the centre. I had seen this action described in the case of an incubating pythoness, and was therefore on the look-out for it; but here the evidence of such an intent, if it really existed, was not well-marked, and it may be fanciful to ascribe such a purpose to those movements. In consequence of this oft-recurring disturbance, I made several attempts to isolate her by interposing a barrier between her corner and the rest of the cage, by inverting boxes over her, and various other protective measures—all of which failed, owing to the awkward construction of the reptilium. Finding them of no avail against the intrusion of her cage-mates, I removed her with the eggs *en masse* on the evening of the 18th, and placed them in a compartment which I had securely partitioned off in a box containing a couple of boas —which box was of course constantly heated by artificial means. The compartment was partly covered with moss, but seeing that she herself had elected to deposit her eggs on the bare woodwork in the first instance, in preference to moss, I acted in accordance with what I presumed to be her taste now, and laid her on the boarded floor. An hour afterwards she forsook her charge, and though I altered the conditions in a dozen different ways in succession, she never returned to them, or appeared to take the slightest further notice of them.

Why did this snake incubate? Another belonging to the same species laid fifty-one eggs in the same cage a few days subsequently, and took no heed of them whatever. Is it to be taken as an indication that the first only were fertile, and that a serpent possesses an instinct which impels it, when depositing properly impregnated ova under circumstances unfavourable for the development of the contained germ or embryo, to endeavour to hatch them instead of leaving them to a fortuitous combination of surrounding influences, as is undoubtedly the rule?

The matter is hardly susceptible of explanation on any hypothesis, so far as I can see. Neglected eggs of this and other species have recently been hatched over the warm tanks at the Zoological Gardens, so that if we assume that infertile ova are always disregarded, we must also admit that those which are fruitful are sometimes deserted. I regret that I did not add the immature and spoiled eggs to the group during the incubation, to note whether the behaviour of the reptile would prevent any variation when these were displaced. Again, the addition of 1·8° to the natural temperature in which these events took place would not have been nearly sufficient to foster the necessary vital processes in the egg; yet that temperature could differ very little from what such a snake would experience in its wild state at this time of the year. And whether she forsook them in consequence of disturbance, or because the heat of the boa's cage relieved her of further responsibility in promoting their germination, is equally a mystery; I incline, however, to the latter view, as an interval elapsed between the time of her removal to a new location (the fact of which did not seem to disturb her) and the moment of her roving.

The reason of a serpent's occasional incubation has never been satisfactorily demonstrated. We know, at any rate, that the practice does not obtain among them as a rule, in a state of nature; we are justified in believing that such a process is quite exceptional—we may indeed doubt whether it ever occurs at all. Even the evidence of the reptile's *defending* its nest is meagre and dubious. In tropical countries the eggs are usually laid on the damp sand, or in marshy jungle, and left without further care to the vivifying influence of the sun; in colder climates they are extruded in manure-pits, hot-beds, heaps of dead leaves and other decaying vegetable matter where heat is generated by fermentation, or in accidentally warm situations; but in both instances one often finds such a deposition without a trace of the snake's recent presence. And for every one of the few cases which have been noted in captivity there have been fifty where no attempt at incubation has been made.

Nevertheless some very extraordinary anomalies have been pointed out with regard to these creatures in this respect. It appears that if a serpent, normally at the full period of ovo-gestation, finds no suitable place for its purpose, it has the power of retaining the eggs for a considerable time, so that they may be hatched within the body of an individual whose species is not ovo-viviparous (this would probably be accompanied by an exacerbation of temperature); and it is even said that the released brood may be retained within the uterus, or oviduct, until the external conditions are favourable for their extrusion. I believe the subject was first brought forward by Mr. P. H. Gosse, in some observations on *Chilobothrus inornatus*, made in Jamaica. It has not yet been thoroughly investigated, and will indeed be very difficult to pursue, since to be of much value it must be followed out among snakes in their wild state. Any embarrassment in this particular with specimens in confinement generally results in abortion or arrest of nutrition, or death of the prospective parent. In the case of a boa-constrictor (pythoness, *Python sebæ*? it was captured on the St. Paul River, Monrovia, Liberia, West Africa) which died suddenly at the Clifton Zoological Gardens in May, 1857, having been "in great health and beauty to within an hour of its death," and which was carefully dissected by Mr. Frank Buckland and other medical men prior to the maceration of its skeleton for the museum of the Royal College of Surgeons, no symptom of disease was discovered, and the cause of death could only be conjectured to be the want of a sufficient depth of sand in its den wherein to deposit the forty large mature ova which were found in it. On the other hand, ovo-viviparous snakes will occasionally extrude their eggs unhatched, from fright, injury, or other causes, and the living young may emerge subsequently. Thus, though different species are tolerably constant in their habit, it seems as though no very distinct line of demarcation can be drawn between oviparæ and ovo-viviparæ, so far as the actual process is concerned; and this close affinity is borne out by the fact that the eggs of some species, recognised as oviparous, are hatched almost immediately after their deposition, while others require a great length of time for their maturation. Those of the grass-snake take from fifty to ninety days, according to the temperature. It is curious that serpents which are obviously very nearly allied in their anatomical and physiological characteristics should often differ in this respect—the boa and python, for instance; while among colubrine snakes we often find the difference marked between different species belonging to the same genus. *Tropidonotus natrix* lays eggs; *T. leberis* and *T. fasciatus* produce their young alive.

I have not seen the retention of derived heat noticed in any previous records of this subject, but I should be glad to know if mine is an exceptional or accidental case. A Ringed Snake is said to have hatched her eggs in the Jardin des Plantes, in Paris, on three successive occasions; I am not aware whether any elevation of the bodily temperature was discovered or not; but with artificially heated surroundings, minute differences would be difficult to obtain confidently. Possibly, too, the storing of heat from the floor among the eggs may have influenced some of the results which have been gathered from incubating pythons and other large serpents; and it may be that in some cases the incubation is confined to a mere defensive shielding of the eggs, unattended by any further phenomena. I believe that this is the first instance in which thermometrical observations have been made under ordinary atmospheric conditions.

OCCASIONAL NOTES.

Variety of the Mole.—Early in June last I examined a somewhat similar variety of the Mole to that mentioned at p. 263. It had been trapped a few days previously near Souldern, in this county. At first sight the colour of the specimen appeared to be a dusky cream, but, on raising the fur, I found that it was of a bright, though pale, apricot colour, each hair having a dusky tip. The colours were warmer and deeper on the lower than on the upper parts.—Oliver V. Aplin (Banbury, Oxon).

Bottle-nosed Dolphin in the Colne.—On July 25th, after considerable chasing, a specimen of this Dolphin, *Delphinus tursio*, was shot in the Colne, near Rowhedge. It was a female, nine feet long; the teeth were sharp, and not at all truncated. It was, therefore, probably not a very aged example. All the specimens I have seen captured near here have been females, but I hear that another had been seen accompanying the captured specimen, and this may have been a male.—HENRY LAVER (Colchester).

COMMON BUZZARD IN THE LAKE DISTRICT.—Whilst in the Lake District I was shown a very fine young *Buteo vulgaris*, which was taken from a nest in the Wythburn district this spring. Buzzards breed annually in Westmoreland or Cumberland, though they are getting much scarcer.—J. BACKHOUSE, JUN. (West Bank, York).

VARIETY OF THE WHEATEAR.—A few days ago I received a young Wheatear from a friend who had shot it, on August 12th, on a hill in Kells, in this county. It is of a very pale gall-blue on the back and wings. and it has also some faint dusky vermiculations principally on the coverts. The under surface was beautifully suffused with rose-colour, which has now almost disappeared. The usual white markings on the tail are of perfect purity.—ROBERT SERVICE (Maxwelltown, Kirkcudbrightshire).

SNIPE PERCHING.—Mr. J. Whitaker reports (p. 267) having seen a Snipe settle on a rail. This puts me in mind of a similar occurrence which I witnessed myself last year in the county of Durham. Whilst busily engaged in extracting an old Wheatear's nest from a bank near to a peat bog of considerable size I was attracted by a Snipe "drumming" not far off, and my surprise was great at seeing the bird suddenly fly straight down on to a rough stone wall, where it sat calling for several minutes. The game-watcher, who was with me at the time, said that he had seen one or two similar cases before, but that it was by no means a usual habit.—J. BACKHOUSE, JUN. (West Bank, York).

KESTREL BREEDING ON THE GROUND.—On the 24th of last month I found a Kestrel's nest upon the ground near the middle of Wicken Fen, in Cambridgeshire. It was built among the long sedge, and there was no shrub which by the greatest stretch of courtesy could be called a tree growing within a mile at least, though within two miles a considerable number of poplars existed. I did not see any vestige of the old birds, but the two young ones which the nest contained showed by their cry and their colour that they were Kestrels without the possibility of a doubt. They were about three-quarters grown, but one was a day or two at least older than the other. In the nest also were the remains of a third young one, which had apparently been just devoured by his brethren. No attempt had been made at constructing a nest, but about two square feet of sedge had been trampled down and used as a nest, though the young birds had considerably extended this by burrowing tunnels under the sedge around for eighteen inches or two feet, which they ran up as we approached. It seems to me a most extraordinary freak for a bird which usually builds on trees or ledges of rock to construct a nest on the ground in the middle of the fen, when a flight of less than two miles (which would be as nothing to it) would have taken it to abundance of trees. Rather curiously this nest was within a few yards of where, last year, I discovered a young Short-eared Owl, and of course I set it down as an Owl's nest at the moment of finding it.—R. M. CHRISTY (Saffron Walden).

CURIOUS NESTING-PLACE OF A GREAT TIT.—A few yards from the house my brother deposited a dead Rat and also a Hedgehog to skeletonise, and placed over them a large inverted flower-pot. Through the drainage-hole at the top a Great Tit found its way, and formed a perfect platform of wool, hair, &c., over the carcasses of the two beasts, whilst at one side she made her nest, and actually lined it with the hair of the defunct Hedgehog.—J. BACKHOUSE, JUN. (West Bank, York).

PINTAIL BREEDING IN WESTMORELAND.—On July the 29th, while visiting the beautiful garden belonging to Miss Meyer, at Low Wood, near Ambleside, I was much gratified by seeing a pair of young Pintail Ducks (*Dafila acuta*), which had been reared upon the pond last year. The brood numbered six in all, I think, and got off successfully. At first, from Miss Meyer's account, the young birds left the grounds where they were reared, and joined some Wild Ducks on Windermere, but after a while they all returned to the pond with the parent bird. This is the first and only time that Miss Meyer has had them breeding, I believe, though other commoner kinds have nested there, notwithstanding that it is close to the main coach-road between Windermere and Ambleside.—J. BACKHOUSE, JUN. (West Bank, York).

[We have received gratifying intelligence of the successful nesting in various counties of several of the less common ducks during the past breeding season, the result, it may be assumed, of the strict observance of the close-time.—ED.]

PHYCIS BLENNOIDES (*Günther*) OFF THE MANX COAST.—On the 8th July last I received a specimen of this fish, for which I am indebted to Mr. Bragg, of Ramsey, in one of whose boats it was caught. It had been taken on a "long line" baited for Conger, some miles to the north-west of Peel, and in about eighty fathoms of water. I had heard of some caught during the last two weeks of June, and had seen a dried specimen on the 26th. From all I can learn it appears never before to have been seen in these waters, and is unknown alike to the fishermen and fish-dealers, who have as yet no name for it. One man, however, tells me that about the same season and place last year four were taken in his boat. Throughout July it has been frequently taken and sent off with other fish to Liverpool. I have received in all three specimens, the general appearance and measurements of which are very similar, and answer closely to the figure and description given in Couch's 'Fishes of the British Islands.' All three were females, and each had a small roe. The livers were very large and white; the air-bladder very tough and strong. Inside, the fish has a thin lining, almost black, which, near the gills, runs into a steel-blue. The outward appearance is as given in Couch. Scales large; colour grey, darker above the lateral line, going into brown, with a tinge of violet on the back and fins. Length about 24½ in. Weight, 5½ lbs., 5 lbs, 11 oz., and 5¾ lbs. The length of the long and short rays of the ventrals of the three specimens, measured from the root on the under side, are respectively 7 in. and 5¼ in., 7¼ in. and 5⅜ in., and 7½ in. and 5¼ in. (Couch gives 8 in. and 5½ in. for a fish two feet in length). One I had boiled; it was white and flaky, and tasted something like cod, but not so good. It was better cold and soused in vinegar. The fishermen like it split and dried. I could not find anything to show what they had been feeding on; the stomachs were all empty and turned inside out. After reading Couch's description I thought the circumstances of its capture at this season and in these waters worthy of record. To-day I hear that it is still being caught, and seems plentiful.—P. M. C. **Kermode** (Ramsey, Isle of Man).

UNUSUAL ABUNDANCE OF DOG-FISH ON THE COASTS OF SCOTLAND.—With reference to Mr. Warren's notes on the unusual numbers of Dog-fish on the coasts of Sligo and Mayo (p. 269), it may interest him and others to learn that the same abundance all along the west coasts of Scotland, and especially in the N.W., has been observed. Can nothing be done to destroy these useless (?) voracious fish. Query: are they really useless, or cannot the carcasses be used as manure, or sold by the cartloadf or some other purpose? On the N.W. coast of Scotland and elsewhere they are knocked on the head and thrown back into the sea. In Lewis, I believe, they are used as manure. The utilisation of our sea produce and improvement in our fisheries is one of the subjects of the prize essays of the coming International Fisheries Exhibition in London. Can no one treat of the utilisation of Dog-fish; development of the Conger Eel fishery; or utilisation of waste fish. At Strome Ferry many Congers are caught and sent up to London market. Congers swarm in every sea-loch in the west of Scotland, and Lobsters can be bought for 6*d*. each, or less, at lots of unfished places, where the supply is greater than the demand. There are miles and miles of coast unfished for want of steam communication with the markets. I may instance forty miles of the N.W. coast of Sutherlandshire, including Cape Wrath. Surely it is the duty of a paternal Government to develop such industries and cheaper food.—J. A. **Harvie Brown** (Dunipace House, Larbert).

The late Professor Balfour.—The very sad fate of the late Francis Maitland Balfour, M.A., F.R.S., who lost his life by a fatal slip on the glacier of Fresney, above Courmayeur, in July last, is now widely known; and but for the fact that the intelligence only reached us when too late to be noticed in our last number, we should ere this have joined in paying that tribute of respect to his memory which has been so universally and so deservedly accorded. The services which have been rendered to zoological science by Mr. Balfour during his brief but brilliant career are too important to be passed over in silence in the pages of a journal which is especially devoted to that branch of the science which is advanced by outdoor work—the observation in the field of the habits of animals. We owe it, therefore, to our readers to place before them some record, however brief and imperfect, of his life and labours. Born in Haddingtonshire in 1852, Mr. Balfour, at the time of his death, had but just attained the age of thirty, and was thus cut off in the very prime of life, in the height of a brilliant career, and while honours were being showered fast upon him. Educated at Harrow, and at Trinity College, Cambridge, where he entered in October, 1870, he early displayed that aptitude for original research, which, happily directed by his friend and professor Dr. Michael Foster, led him through a course of study resulting eventually in the publication of several important memoirs. So early as 1873, in which year he obtained his B.A. degree, we find him contributing valuable papers on morphology to the 'Quarterly Journal of Microscopical Science,' and in that same year, as one of the two representatives of the University of Cambridge, he proceeded with Mr. Dew-Smith to the zoological station at Naples, then recently established. Here he worked assiduously in investigating the development of the Elasmobranch Fishes, the results of which study were eventually maturely considered and succinctly stated in his 'Monograph' on that subject, published in 1878, after being first foreshadowed in separate papers in the 'Philosophical Transactions' for 1876, and in the 'Journal of Anatomy and Physiology' from 1876 to 1878. Of the value and importance of this work, Dr. Michael Forster has observed, in the pages of our contemporary 'Nature,' that "from the very beginning to the very end of the investigation, almost every step serves to throw light on important biological problems. Every chapter from the first, which deals with the ovarian ovum, to the last, which treats of the urogenital organs, contains a record of inquiries which have left their stamp on morphological doctrines." His elevation to a Natural Science Fellowship at Trinity College stimulated him to further efforts, and he commenced to give lectures upon Animal Morphology, which were largely attended. Carrying on at the same time investigations into various problems of morphology and embryology, he accumulated material for his great work on 'Comparative Embryology,' which has since been published, and translated into other languages, and has come to be regarded as the text-book *par excellence* on the subject of which it treats. By the publication of these two important works Mr. Balfour's fame was established, and honours on all sides were bestowed upon him. In 1878 he was elected a Fellow of the Royal Society, and in 1881 was not only placed on the Council, but received the high distinction of a Royal Medal. In the same year the University of Glasgow conferred on him the degree of LL.D., and in December last he was elected President of the Cambridge Philosophical Society. He was invited to succeed the late Professor Rolleston in the Linacre Professorship at Oxford, and was also pressed to take the chair of Natural History at Edinburgh, but declined both these honours, preferring to wait until some occasion might arise which would enable him to accept office in his own University. Fortunately he had not long to wait; for his merits were so fully and generally recognised that in the spring of the present year a chair of Animal Morphology was specially created for him, and he was unanimously elected to occupy it. It was during a temporary absence from Cambridge, for the enjoyment of that change of air and scene, which is periodically so essential to all brain-workers, that Mr. Balfour lost his life. By some untoward accident, the details of which can never be known (since his guide and only companion perished with him), the work of Science was suddenly and painfully deprived of one of its brightest ornaments. It has fallen to the lot of but few to attain, at such an early period of life, so eminent a position in the world of Science, and although fellow-workers in the same field will be for ever grateful for the valuable works which he fortunately lived to publish, they will for ever regret that he was not spared to accomplish more, and to give to the world still further proofs of that extraordinary ability which he possessed as an original investigator in one of the most important branches of biological science.

THE LATE PROFESSOR LEITH ADAMS.—We regret to have to add another name to the death-roll of working zoologists—that of Andrew Leith Adams, M.D., F.R.S, late Professor of Natural History at Queen's College, Cork. His name will be familiar to most of our readers as author of many pleasantly written works of travel, in which records of sport and natural history are agreeably combined. We have before us his 'Wanderings of a Naturalist in India,' 'Field and Forest Rambles in Canada,' and 'Notes of a Naturalist in the Nile Valley and Malta,' the last named perhaps being the most noteworthy from the zoologist's point of view. All these books were written by Dr. Adams in the hours of leisure from duty as Army Surgeon, in which capacity he was attached first to the 94th Regiment, which he joined in 1848, and subsequently to the 22nd Regiment. It was with the latter regiment that he served in the war of the North-west Frontier in 1854-55, and earned the medal given for that service. His travels in various parts of the world enabled him to cultivate a taste for outdoor observation of animals and plants, and to lay up a store of facts which his professional knowledge of anatomy and physiology enabled him subsequently to turn to good account. He retired from the Army in 1873 with the rank of Deputy Surgeon-General, and in the following year became a successful candidate for the Professorship of Zoology in the Royal College of Science at Dublin; whence in 1878 he was elected to fill the chair of Zoology and Anatomy at Queen's College, Cork. His residence in Ireland caused him to pay somewhat particular attention to Irish Mammals, more especially the fossil and extinct species. The results of his investigations on this subject will be found embodied in his "Report on the History of Irish Fossil Mammals," read before the Royal Irish Academy, 10th June, 1877, and published in the 'Proceedings' of the Academy, 2nd series, vol. iii., and a further paper "On recent and Extinct Irish Mammals," published in the 'Scientific Proceedings of the Royal Dublin Society' for 1878. His remarks on the Ursine remains, which he examined from all parts of Ireland, wherever they were procurable, are valuable as having been based on the examination and comparison of an extensive series, and his observations on other species now extinct in Ireland are, many of them, of much interest to zoologists. His most important scientific work perhaps is a "Monograph of the Fossil Elephants of the Maltese Islands," the materials for which were collected chiefly while he was quartered at Malta, and which was published in the 'Transactions of the Zoological Society' for 1875. In a previously published Report on this subject (Rep. Brit. Assoc, 1873, pp. 185—187), Dr. Adams had recognised as distinct species *Elephas melitensis*, Falconer, *E. mnaidriensis*, Adams, and (more doubtfully) *E. falconeri*, Busk. The remains of all three species are figured in his monograph, with a map showing the localities in which they were found. He was elected a Fellow of the Royal Society in 1872, and LL.D. of Aberdeen in 1881.

NOTICES OF NEW BOOKS.

The Compleat Angler, or the Contemplative Man's Recreation. Being a Discourse of Fish and Fishing, not unworthy the perusal of most Anglers. London: printed by T. Maxey for Rich. Marriot in S. Dunstan's Churchyard, Fleet Street, 1653. [Facsimile. London, 1882. Quaritch.]

THE popularity of Izaak Walton's 'Compleat Angler' may be estimated from the fact that according to the most recent authority (Mr. Thomas Satchell, who has been long engaged in preparing for the press a new edition of Westwood's 'Bibliotheca

Piscatoria') there have been published no less than eighty-seven editions of this book! Here is his list of them, the result of much labour and research:—

Date.	Place.	Publishers.	Editors.
1653	London	Marriot	Author (?)
1655	,,	,,	Author.
1661	,,	,,	,,
1664	,,	Marriot; Gape	,,
1668	,,	Marriot; Harper	,,
1676	,,	Marriot	,,
1750	,,	H. Kent	Moses Browne.
1759	,,	,,	,,
1760	,,	T. Hope, &c.	Hawkins.
1766	,,	J. Rivington, &c.	,,
1772	,,	R. & H. Causton	Moses Browne.
1775	,,	J. & F. Rivington	Hawkins.
1784	,,	J. F. & C. Rivington	,,
*1791	,,	,,	,,
1792	,,	Rivington and others	,,
1797	,,	,,	,,
1808	,,	S. Bagster.	,,
1810	,,	,,	——
1815	,,	,,	Hawkins & Ellis.
1822	,,	J. Smith	Hawkins.
1823	,,	John Major	R. Thompson.
*1824 (?)	London (?)	Maunder (?)	——
1824	,,	John Major	Thomson & Major.
1824	,,	Tegg	Hawkins.
1825	,,	Printed by Dove	,,
1825	,,	Pickering	——
1826	,,	,,	——
1826	,,	Tegg	Hawkins.
1828 (?)	,,	W. Cole	——
1833	Edinburgh, &c.	Chambers and others	Hawkins & Rennie.
1834	London, &c.	A. Bell and others	,,
*1834	London	A. Bell & Simpson & Co.	,,
*1834	Edinburgh, &c.	Fraser and others	,,
1835	London	John Major	Thomson & Major.
1835	London, &c.	Tegg and others	Hawkins & Rennie.
1836	London	Pickering	Nicholas.
1836	,,	A. Bell	Hawkins & Rennie.
*1836	Edinburgh, &c.	Fraser and another	,,
1837	London, &c.	C. Tilt and others	——
1839	London	Lewis	Major.
*1841	,,	Chidley	——
1842	,,	Washbourne	Major.
*1844	,,	Sherwood & Bowyer	——
1844	,,	Bogue; Wix	Major.
*1844	Manchester	S. Johnson	Hawkins & Rennie.
*1846	,,	,,	,,
*1847	Dublin	W. Curry	,,
*1847	Manchester	T. Johnson	,,
1847	New York	Wiley & Putnam	Bethune.
1848	,,	,,	,,
*1848	Liverpool	T. Johnson	Hawkins & Rennie.

Date.	Place.	Publishers.	Editors.
*1849	London, &c.	T. Johnson and another	Hawkins & Rennie.
1849 (?)	Manchester	T. Johnson	,,
1851	London	H. Kent Causton	Moses Browne.
*1851	Manchester	T. Johnson	Hawkins & Rennie.
1852	New York	Wiley & Putnam	Bethune.
1853	London	Ingram, Cooke & Co.	" Ephemera."
1854	,,	N. Cooke	,,
1856	,,	Bohn	Jesse
*1857	Manchester	Johnson	Hawkins & Rennie.
1857	Halifax	Milner & Sowerby	,,
1858	London	Groombridge	—
1859	,,	Routledge	" Ephemera."
*1859	New York	Wiley & Putnam	Bethune.
1859	Hamburg	Solomon	" Ephemera."
1860	London	Nattalie & Bond	Nicholas.
1861	,,	Bohn	Jesse.
1863	,,	Bell & Daldy & S. Low	—
1864	,,	Bell & Daldy	—
1866	Boston	Ticknor & Field	—
1866	,,	Little, Brown & Co,	Major.
1866	New York	Wiley & Sons	Bethune.
1867	Boston	Little, Brown & Co.	Major.
1869	London	A. Murray	—
1872	,,	,,	—
1875	,,	Chatto & Windus	Nicholas.
1876	,,	G. Bell & Sons	Jesse.
1876	,,	E. Stock	—
[1878]	,,	Routledge	" Ephemera."
[1878]	,,	F. Warne	G. C. Davies.
1878	,,	Ward, Lock & Co.	—
1878	,,	G. Bell & Sons	—
1879	,,	Fishing Gazette	—
1880	New York	Wiley & Sons	Bethune.
1881	London, &c.	Routledge	" Ephemera."
[1881]	Philadelphia	Lippincott	Major.
[1881]	London	Strahan & Co.	,,

Mr. Satchell, in a note on the subject to a contemporary, says :—" I have satisfied myself of the existence of these eighty-seven reprints, with one exception, by personal examination. There are others, but my attempts to obtain copies of them have failed. Many differ only in the name of the publishers or in the date. Those marked with a star have escaped the notice of Ellis, Pickering, Russell Smith, Bohn, and Westwood (1864), and are here recorded for the first time. The most important of them is the Hawkins of 1791 ; the others are chiefly issues of the Hawkins-Rennie series."

To this long list another edition has just been added in the shape of a facsimile of the first edition of 1653, issued by Mr. Quaritch.

The merit of this facsimile lies in the fact of its having been produced by Mr. W. Griggs, whose name is well known in connection with his labours as photo-lithographer to the India Office. The very careful way in which all his facsimiles have been prepared have met with the approbation of competent critics, and we may therefore assume, without actually making a comparison, that the little volume before us is really what it purports to be—a perfect copy of the original.

If we have one fault to find it is that the paper is too stout, causing the volume to be about twice as thick as the original. It may of course be urged that the original paper was poor stuff, as no doubt it was; nevertheless we cannot help thinking that something less substantial than that which has been selected in the present instance would have answered the purpose, and would, moreover, have enabled the printer to obtain brighter impressions of the cuts, which strike us as being a little faint.

Still, it must be borne in mind that copies of the first edition of 'Walton's Angler' do not turn up every day, and, when they do occur, realise high prices. We have just had the pleasure of looking over a very perfect copy of the first edition, priced £25; but for all practical purposes we feel quite happy in the possession of Mr. Griggs' facsimile, published at the very moderate cost of seven shillings and sixpence.

Unlike a great many previous editions, the present one is of the exact size of the original, the type measuring something less than five inches by two and a half. Hence it is a veritable pocket volume.

At this season of the year what can be pleasanter than with such a book in hand—

> "To lie amid some sylvan scene
> Where, the long drooping boughs between,
> Shadows dark and sunlight sheen
> Alternate come and go,"

conjuring up fancies of that quaint, genial, tender-hearted old fisherman and pleasant companion, the perusal of whose book causes one to exclaim, "How I should like to have known him, and to have gone a fishing with him!"